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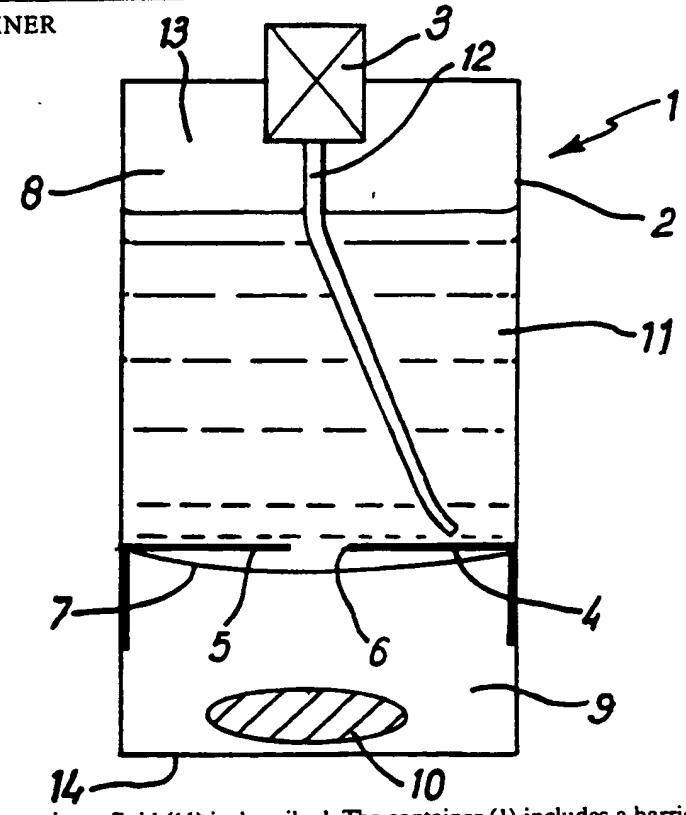

(57) Abstract

A pressurised container (1) for dispensing a fluid (11) is described. The container (1) includes a barrier (4) which is permeable to gas but is impermeable to liquids and solids. The barrier (4) divides the container into a first chamber (8) for containing the fluid (11) to be dispensed, and a second chamber (9) for containing a propellant (10). As fluid (11) is dispensed from the first chamber (8) gas from the propellant (10) in the second chamber (9), passes through the barrier (4) to equalise the pressures in the first and seond chambers.

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"A Pressurised Container"

The invention relates to a pressure pack dispenser, and in particular, a pressurised container for the dispensing of fluids.

Conventional "airspray" type pressurised containers for dispensing fluids use a low boiling point propellant mixed with the product formulation. As the product is dispensed from the container the low boiling point propellant is discharged simultaneously and on leaving the container the propellant evaporates to produce a very fine spray of propellant, typically of the order of 15 um.

However, one disadvantage with this type of conventional airspray container is that the low boiling point propellant is generally flammable and typically comprises butane or propane. Hence, the spray from the airspray is flammable. Other conventional airspray containers use a CFC as a propellant which has the disadvantage of being detrimental to the environment and in both types of airspray there is the danger of solvent abuse. Furthermore, the low boiling point propellant is mixed with the product formulation throughout the shelf-life of the pressurised container.

In accordance with one aspect of the present invention, a pressurised container for dispensing a fluid comprises a container, a barrier permeable to gas and which is substantially impermeable to liquids and solids, the barrier mounted within the container to divide the container into a first chamber and a second chamber, the first chamber communicating with an outlet in the container through which a fluid in the first chamber may be dispensed, a valve mechanism to regulate dispensing of the fluid through the outlet, and an outlet conduit coupled to the outlet and extending into the first chamber, wherein gas in either the first or the second chamber may pass through the barrier to equalise the pressures in the first and second chambers.

In accordance with a second aspect of the present invention, a pressurised container comprises a barrier permeable to gas and substantially impermeable to liquids and solids, the barrier mounted within the container and dividing the container into a first chamber and a second chamber, a valve mechanism isolating an outlet in the container from the first chamber and movable between a closed position and an open position, the first chamber containing a fluid comprising a liquid saturated with a gas, and the second chamber containing a propellant; wherein movement of the valve mechanism to the open position permits the liquid to be dispensed from the container through the valve mechanism by the pressure of the fluid in the first chamber and dispensing of the fluid from the container decreases the pressure in the first chamber and causes the passage of propellant gas from the second chamber through the gas-permeable barrier to the first chamber to equalise the pressures in the

first and second chambers.

Typically, in the second aspect of the invention, the pressurised container also includes an outlet conduit coupled to the valve mechanism and which extends into the first chamber.

Preferably the barrier may have pores of approximately two microns size and may comprise a gas permeable material such as a fabric, such as REPEL (trade mark) manufactured by Gelman Sciences.

Typically, the barrier may include a main body section manufactured from a gas impermeable material, such as plastic, with one or more apertures in the body section and a gas permeable material covering the one or more apertures in the body section. Typically, the gas permeable material is fixed to the body section so that the material seals around the apertures in the body section. Typically, the material is fabric. In one example a single aperture could be provided, typically of a few millimetres diameter and preferably, greater than 5 millimetres.

Alternatively, the barrier could be formed around an outlet conduit extending into the first chamber, the outlet conduit being impermeable to gas. In this embodiment, the second chamber is formed between the gas permeable barrier and the external surface of the outlet conduit and the first chamber is the remainder of the container. Typically, in this example, the gas permeable barrier could be generally in the form of a cylinder of gas permeable material which is sealed to the outlet conduit at the end of the outlet conduit remote from the outlet valve and the other end of the

cylinder of gas permeable material being attached onto the upper section of the container or onto the outlet valve.

This example of the invention is particularly advantageous where the container has a one way sealing gasket, at the top of the can adjacent the valve, which permits substances to be inserted into the can through the gasket but prevents the escape of pressure from the container. In this case, the upper end of the gas permeable material could be attached to the top of the can so that the propellent may be inserted into the second chamber between the gas permeable material and the outlet conduit by inserting the propellent through the gasket.

In accordance with a third aspect of the present invention, a pressurised container for dispensing a fluid comprises a container, a barrier substantially impermeable to a pressurising propellant and a fluid comprising a liquid saturated with a gas in the container, the barrier mounted within the container to divide the container into a first chamber and a second chamber and having valve means for selectively allowing passage of the propellant through the barrier, the first chamber communicating with an outlet in the container through which a fluid in the first chamber may be dispensed, a valve mechanism to regulate dispensing of the fluid through the outlet, and an outlet conduit coupled to the outlet and extending into the first chamber, wherein the pressure of a propellant in the second chamber is transmitted to the fluid by means of passage of propellant gas through the valve means in response to a pressure drop in the first chamber caused by opening of the valve mechanism to

permit the fluid to pass through the outlet conduit and be dispensed through the outlet.

In accordance with a fourth aspect of the present invention, a pressurised container comprises a barrier substantially impermeable to a pressurising propellant and a fluid comprising a liquid saturated with a gas in the container, the barrier mounted within the container and dividing the container into a first chamber and a second chamber and having valve means for selectively allowing passage of the propellant through the barrier; a valve mechanism isolating an outlet in the container from the first chamber and movable between a closed position and an open position, the first chamber containing a fluid comprising a liquid saturated with a gas, and the second chamber containing a propellant; wherein movement of the valve mechanism to the open position permits the liquid to be dispensed from the container through the valve mechanism by the pressure of the fluid in the first chamber and dispensing of the fluid from the container decreases the pressure in the first chamber to actuate the valve means to permit passage of propellant gas from the second chamber to the first chamber.

Preferably the valve means for selectively allowing passage of the propellant is actuable on reduction of the pressure of the fluid in the container. Said means is preferably a valve mechanism, such as a "woodcroft" type valve or "butterfly" type valve.

Typically, in the fourth aspect of the invention, the pressurised container also includes an outlet conduit coupled to the valve mechanism and which extends into the first chamber.

Typically, the outlet conduit extends into the first chamber so that the end of the outlet conduit remote from the valve mechanism is adjacent to the bottom of the first chamber in order to evacuate the first chamber of as much product as possible.

Typically, the outlet conduit may have a straight or helical and/or spiral configuration and in addition, or alternatively, may have through apertures in its side wall.

Preferably, the valve mechanism comprises means to aerate the liquid as it passes through the valve mechanism and this means could comprise at least one vapour tap in the valve mechanism which permits gas not in solution on the liquid to aerate the liquid as it passes through the valve mechanism.

Preferably, the vapour tap in the valve mechanism may have a diameter of, for example, 0.010 to 0.050 inches, typically 0.015 to 0.030 inches.

Typically, the particle size of fluid dispersed through the outlet may be, for example, 10 to 30 um, and preferably 15 to 20 um.

Preferably, liquid may be dispersed through the outlet at a rate of, for example, 0.1 to 0.5 grams per second, and typically 0.2 to 0.3 grams per second.

Typically, the propellant could be any suitable propellant. However, preferably, the propellant comprises a pressurised gas, such as nitrogen or carbon dioxide. Alternatively, or in addition, the propellant could comprise a propellant system, such as described

in European Patent Application No 0,385,773.

Preferably, the gas which saturates the liquid is a gas, such as carbon dioxide or nitrogen. However, any other suitable gas could be used.

Preferably, the initial pressure within the pressurised container is at least substantially 100 psi and typically, may be substantially 130 psi or greater.

Preferably, the volume ratio of the first chamber to the second chamber is substantially 60:40.

Preferably, the gas not in solution in the liquid may occupy a volume of approximately 10% of the first chamber.

Preferably, the volume of gas not in solution in the first chamber, exerts a pressure equal to that of the propellant gas in the propellant chamber.

The apparatus may further have means to retain the barrier in a fixed position during and after pressurisation of the propellant. Typically, the means to retain the barrier in position may comprise flanges on an edge of the barrier which engage with a side wall of the container.

Alternatively, or in addition to flanges on the edge of the barrier, one or more lugs may be provided on the inside wall of the container to engage with and retain the barrier in position within the container.

Alternatively, the container may comprise a barrier as a fixture of the container, such that it is permanently

retained in position during pressurisation of the container.

Preferably, the pressure operable valve mechanism in the barrier comprises a valve member which seals an aperture in the barrier and the valve mechanism opens when the pressure on the one side of the barrier exceeds the pressure on the other side.

The valve mechanism may comprise a movable portion of the barrier which typically may be provided by making a portion of the material of the barrier flexible.

Typically, the movable portion is movable between a first position in which the valve mechanism is closed a second position in which the valve mechanism is open. Typically, the valve mechanism may be opened by rupture of the movable portion moves to the second position. Alternatively, the valve mechanism could further include a valve member which seals with the movable portion when the movable portion is in the first position to prevent propellant passing through the valve mechanism but which does not seal with the movable portion when the movable portion moves to the second position, in order to permit propellant to pass through the valve mechanism.

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:-

Fig. 1 is a cross-sectional view through a first example of a pressurised dispenser;

Fig. 2 is a cross-sectional view through a second example of a pressurised dispenser;

Fig. 3 is a cross-sectional view through a third

example of a pressurised dispenser;
Fig. 4 is a cross-sectional view through a fourth example of pressurised container; and
Fig. 5 is a cross-sectional view through a fifth example of pressurised container.

Fig. 1 shows a pressurised dispenser 1 which comprises a can 2 with an outlet valve 3 fixed in an opening in the top of the can 2. Mounted inside the can 2 is a piston 4 which is typically fixedly mounted within the can 2 in order to prevent movement of the piston 4 inside the can 2. For example, the piston 4 could be fixedly mounted in the can 2 by bonding the piston to the side walls of the can for example with adhesive, or by engagement of the piston 4 with internal lugs in the can which prevent movement of the piston 4. The piston 4 has a central section 5 which has an aperture 6 therein. Typically, the aperture 6 is of the order of a few millimetres in diameter and in one example may be 6 to 8 millimetres in diameter. Sealed onto the surface of the central section 5 is a gas permeable membrane 7. In the example shown, the gas permeable membrane is a material with a two micron pore size which may be similar to that manufactured by Gelman Sciences and described as a micro porous membrane.

The piston 4 divides the inside of the can 2 into a product chamber 8 and a propellent chamber 9. The propellent chamber 9 contains a propellent system, such as described in European Patent Application No 0,385,773 which may use a propellent gas, such as carbon dioxide in combination with a solvent such as acetone and a polymer into which the acetone is sorbed. In Fig. 1 the propellent system is denoted generally by the reference numeral 10. The product chamber 8

contains a liquid product 11 to be dispensed from the dispenser 1 through the outlet valve 3 via a dip tube 12. The product 11 is saturated with a gas such as carbon dioxide and the carbon dioxide not absorbed into the liquid 11 fills a head space 13 above the liquid 11. The outlet valve 3 may have one or more vapour tapes (not shown) which consist of a small aperture which extends from the outside surface of the valve 3 into an interior passage (not shown) of the valve 3 through which liquid 11 is dispensed. Hence, the one or more vapour taps permit the gas in the head space 13 to communicate with the internal passage of the valve 3 through which the liquid 11 is dispensed.

In order to fill the dispenser 1 the bottom 14 of the can maybe initially removed and the piston 4 inserted into the can 2 through the open bottom section and then the propellent system 10 inserted into the can 2 after the piston 4. The bottom portion 14 of the can is then sealed to the rest of the can 2. The liquid product 11, supersaturated with carbon dioxide gas may be introduced into the can, for example by back filling through the valve 3 and dip tube 12 until the required volume of liquid 11 is within the can 2. Typically, the volumes are chosen such that the head space 13 occupies a volume of approximately 10% of the volume of the can 2. After the dispenser 1 has been filled the pressure in the product chamber 8 and the propellent chamber 9 equalise as carbon dioxide gas is free to pass through the gas permeable membrane 7 between the two chambers, via the aperture 6. However, the gas permeable membrane 7 prevents the liquid 11 entering the propellent chamber 9, and also prevents a propellent system 10, other than the propellent gas entering the product chamber 8.

Typically, the starting pressure with a full can may be in the region of 100 psi to 150 psi. When the outlet valve 3 is opened, the pressure in the product chamber 8 causes the liquid product 11 to be dispensed through the valve 3 via the dip tube 12. The one or more vapour taps permit gas in the headspace 13 to aerate the liquid 11 as it passes through the valve 3 in order to help create a fine spray of the product 11 as the product 11 exits the valve 3. If a fine spray is not required then the one or more vapour taps could be omitted.

When a portion of the liquid 11 has been dispensed from the product chamber 8 the pressure within the chamber will have decreased. Hence, a pressure differential will exist between the propellent chamber 9 and the product chamber 8 which will cause carbon dioxide gas to flow from the propellent chamber 9 through the gas permeable membrane 7 and the aperture 6 into the product chamber 8 to equalise the pressure between the chambers. As the pressure in the propellent chamber 9 falls due to passage of the propellent gas into the product chamber 8, the propellent system 10 will release propellent gas into the propellent chamber 9 and the operation of the propellent system is described in more detail in European Patent Application No 0,385,773 A.

Hence, the invention has the advantage of permitting the gas in the headspace 13 to be replenished by making use of a gas permeable barrier to separate the propellent chamber from the product chamber. This has the advantage of also isolating the product 11 from the propellent system 10 to prevent any contamination occurring between the product 11 and the propellent

system 10. It also has the advantage that if the pressure in the product chamber increases, for example due to an increase in the temperature of the can 2, the increase in pressure will cause carbon dioxide gas to be reabsorbed into the propellent system 10 and excess pressure in the product chamber 8 will be reduced by carbon dioxide gas passing from the product chamber 8 into the propellent chamber 9 to be reabsorbed into the propellent system 10.

Fig. 2 shows a second example of the invention in which components identical to the components in Fig. 1 have identical reference numerals. In Fig. 2 the principal difference between this example and the dispenser shown in Fig. 1, is that the dispenser 20 shown in Fig. 2 has a barrier 23 separating product chamber 25 from propellent chamber 24. This barrier is a piece of gas permeable membrane which is physically attached to the can by sealing the edges of the membrane between the bottom edges of the walls of the can and the base 22 of the can which is fixed into the bottom edges of the can 2.

However, the operation of the dispenser 20 and in particular, of the gas permeable membrane 23 is essentially identical to the operation described above for the dispenser 1 in Fig. 1.

Fig. 3 shows a third example of the invention in the form of a dispenser 30. In the dispenser 30 the can 2 is similar to the can 2 shown in Figs. 1 and 2 but the top section of the can is shown in more detail. Generally, most pressurised dispenser cans 2 have an opening of approximately one inch diameter at the top of the can into which a moulded valve mounting section

31 is attached by crimping the section 31 onto the can 2 at a joint 32. The valve mounting section 31 has a central aperture into which an outlet valve 3 is mounted and the mounting section 31 is crimped onto the valve body by means of typically, eight spot crimps. The valve 30 is sealed to the mounting section 31 by means of a rubber gasket 33 which acts as a seal to prevent pressure escaping from the can 2 at this mounting point.

In the dispenser 30, the gas permeable membrane 34 is generally cylindrical in shape and extends around the dip tube 12. The membrane 34 is sealed to the outer surface of the dip tube 12 at a point 35 and the upper section of the membrane 34 is fixed to the can 2 by trapping the upper edge of the membrane 34 in the joint 32 between the valve mounting section 31 and can 2. In this manner, the fluid of the propellent system 10, in the form of acetone saturated with carbon dioxide to the desired pressure may be inserted into the propellent chamber 9, defined by the membrane 34 and dip tube 12, under pressure between the gasket 33 and valve mounting section 31. The product 11, which could be presaturated with carbon dioxide gas, may be inserted into the product chamber 8 by backfilling the product chamber 8 through the valve 3 and dip tube 12. As an alternative to presaturating the product with carbon dioxide gas, the product could be inserted into the product chamber 8 and then carbon dioxide gas forced into the product chamber 8 under the desired pressure. This could occur simultaneously with the insertion of the fluid component of the propellent system 10 and this would have the advantage of helping to balance the pressure on either side of the membrane 34. As with the first and second examples described

for Figs. 1 and 2, the gas permeable membrane 34 permits equalisation of gas pressurises between the product chamber 8 and propellent chamber 9 while preventing the liquid product 11 entering the propellent chamber 9 and similarly preventing the liquid and solid elements of the propelling system 10 entering the product chamber 8. In the example shown in Fig. 3 the polymer which forms part of the propellent system is shown in granular form and occupies part of the volume between the membrane 34 and dip tube 12.

However, as an alternative to this the polymer for the propellent system 10 could be in the form of a suitable coating on the external surface of the dip tube 12 or alternatively, could take the form of a coating on the propellent chamber surface of the membrane 34.

As an alternative to fixing the top edge of the membrane 34 to the can at the join 32 the membrane could be sealed to the mounting section 31 in the vicinity of the spot crimps which attach valve body 36 to the mounting section 31. In this example the acetone with dissolved carbon dioxide gas could be inserted into the propellent chamber 9 through the gaps formed between the spot crimps which attach the valve body 36 to the mounting section 31.

Fig. 4 shows a pressurised container 51 which includes a barrier 52 mounted within the container 51 and is used to separate and isolate a propellant 53 from a liquid 54 in the container 51. The barrier 52 also divides the container 51 into a product chamber 55 and a propellant chamber 56.

The barrier 52 includes a pressure operable valve mechanism 57 which is formed from the same material as the rest of the barrier 52, for example, a plastics material such as polyethylene. In addition, flanges 58 are formed on the outside surface 59 of the barrier 52 and these flanges sealingly engage with the internal wall of the container 51 and retain the barrier 52 in the position shown in Fig. 4.

The container 51 also includes a valve 60 which isolates an outlet 61 from a dip tube 62 which extends from the valve 60 to the barrier 52. The valve 60 includes at least one vapour tap (not shown) which consists of a small aperture which extends from the outside surface 63 of the valve 60 into an interior passage (not shown) of the valve 60 through which a liquid 54 in the product chamber 55 is dispensed to the outlet 61. The dip tube 62 is typically manufactured from a flexible plastics material, such as polyethylene, or any other suitable flexible plastic which does not chemically react with the contents of the product chamber 55.

The liquid 54 in the product chamber 55 comprises a liquid saturated with a gas and excess gas in the product chamber 55 forms a headspace between an upper wall 65 of the container 51 and the surface 16 of the fluid 54. Typically, the gas 64 is nitrogen or carbon dioxide.

Located in the propellant chamber 56 is a suitable propellant, which could be pressurised gas such as nitrogen or carbon dioxide or could be a propellant system, such as that disclosed in European Patent Application No 0,385,773.

In order to fill the container 51 the following procedure may be adopted. Initially a predetermined amount of propellant 53 is introduced into the container and the barrier 52 is then inserted in the container 51 and pushed along the container to the position shown in Fig. 4. As the flanges 58 seal with he internal walls of the container 51, the propellant 53 is prevented from escaping past the barrier 52 and the propellant becomes pressurised due to the reduction in volume.

The container is then filled with liquid 54, pre-saturated with gas 64, which liquid sits on top of the barrier 52 and is isolated from the propellant 53 by the barrier 52. The liquid 54 and gas 64 may be inserted into the container 54, for example by back-filling the product chamber 55, by pumping the liquid 54, pre-saturated with gas 64, at a pre-determined pressure through the valve mechanism 60 and the dip-tube 62. In the particular example described here, the amount of propellant is chosen so that when approximately 60% of the interior volume of the container 51 is occupied by product, the pressure of the propellant 53 inside the propellant chamber 56 is approximately 130 psi.

The liquid 54 is saturated with gas at a pressure similar to the pressure of the propellant 53 so that when the valve mechanism 60 is in the closed position, the pressure of the liquid 54 and the propellant 53 are approximately similar. Hence, because of the similarity in pressure between the liquid 54 and the propellant 53, the pressure operable valve mechanism 57 of the barrier 52 stays in its sealed position.

When the valve 60 is opened the internal pressure in the container 51 forces liquid 54 through the dip tube 62, through the valve 60 and out of the container 51 through the outlet 61. The vapour taps permit some of the gas 64 in the headspace to enter into the internal passage of the valve mechanism 60. As the liquid 54 passes through the valve 60, the liquid 54 is aerated by the gas 54 so that when the liquid/gas combination is expelled through the outlet 61 a fine spray is produced. Using this principal it may be possible to obtain particle sizes for the spray down to 20 um or smaller.

After some of the liquid 54 and the gas 64 has been dispensed from the container 51 the pressure within the container 51 will drop. Hence, more gas 64 will come out of solution from the liquid 54 due to the drop in pressure and replenish the gas lost through the vapour taps.

As will be apparent from the above description, as more liquid 54 and gas 64 is dispensed through the outlet 61 the more the pressure inside the container 51 will decrease. This decrease in pressure opens the valve 57 and permits the propellant gas 53 to flow upwards through the valve mechanism 57 in order to equalise the pressures between the product chamber 55 and the propellant chamber 56.

The vapour taps are designed so that the dimensions are such that the gas 64 produced from the liquid 54 as the pressure drops will not be exhausted through the vapour taps faster than the usage of the container 51 would allow the gas to reform. Hence, this would ensure that sufficient headspace is maintained to allow the vapour

taps to work until the liquid 54 in the product chamber 55 has been exhausted.

When the valve mechanism 60 is opened, the flanges 58 which engage with the side wall of the container 51 retain the barrier 52 in the position shown in Fig. 4 against the action of the pressure differential between the propellant 53 and the liquid 54.

In addition, lugs could be provided on the inside of the container 57 to facilitate retention of the barrier 52 within the container 51 in the position shown in Fig. 4.

Fig. 5 shows a second example of a pressurised container 70, which includes a barrier 71 as a fixture mounted within the container 70. The barrier 71 is used to separate and isolate a propellant 72 from a liquid 73 in the container 70 and to divide the container into product chamber 74 and a propellant chamber 75. The barrier 71 includes a pressure operable valve mechanism 76 and is manufactured from a plastics material such as polyethylene. The barrier is pre-fitted inside the container 70 to a pre-determined spacing from the base 77 of the container 70.

The container 70 also includes a valve 78 which isolates an outlet 79 from a dip tube 80 which extends from the valve 78 to the barrier 71. The valve 78 includes at least one vapour tap (not shown) which consists of a small aperture which extends from the outside surface 81 of the valve 78 into an interior passage (not shown) of the valve 78 through which a liquid in the product chamber 74 is dispensed to the outlet 79.

The fluid 73 comprises a liquid saturated with a gas and excess gas 82 forms a headspace between an upper wall 83 of the container 70 and the surface 84 of the liquid 73. Typically, the gas 82 is nitrogen or carbon dioxide.

The container 70 also comprises a plug 85 which seals an aperture 86 in the bottom surface 77 of the propellant chamber 75.

In use, liquid 73 pre-saturated with gas 82 is introduced into the product chamber 74, for example, by back-filling the product chamber 74 by pumping the liquid 78 pre-saturated with gas 82 at a predetermined pressure through the valve mechanism 78 and the dip tube 80.

Propellant 72 is introduced into the propellant chamber 75 through the aperture 85 and the aperture is then sealed with a plug 85. The amount of propellant 72 required is pre-determined so that the pressure of the propellant 72 substantially equals the pressure of the excess gas 82. Typically, the propellant 72 is introduced into the chamber 75 by adding a pre-determined amount of propellant 72 in a substantially non-gaseous form, for example a propellant gas 72 which has been cryogenically cooled to a temperature at which the propellant gas is liquefied or solidified. Hence, the chamber 75 is loaded with the propellant gas 72 at ambient atmospheric pressure, with the subsequent thawing giving rise to the essential gaseous pressure of the propellant.

Operation of the container 70 is similar to the operation of container 51 as described in above and

shown in Fig. 4.

Improvements and modifications may be incorporated without departing from the scope of the invention.

CLAIMS

1 A pressurised container for dispensing a fluid comprising a container, a barrier permeable to gas and which is substantially impermeable to liquids and solids, the barrier mounted within the container to divide the container into a first chamber and a second chamber, the first chamber communicating with an outlet in the container through which a fluid in the first chamber may be dispensed, a valve mechanism to regulate dispensing of the fluid through the outlet, and an outlet conduit coupled to the outlet and extending into the first chamber, wherein gas in either the first or the second chamber may pass through the barrier to equalise the pressures in the first and second chambers.

2 A pressurised container comprising a barrier permeable to gas and substantially impermeable to liquids and solids, the barrier mounted within the container and dividing the container into a first chamber and a second chamber, a valve mechanism isolating an outlet in the container from the first chamber and movable between a closed position and an open position, the first chamber containing a fluid comprising a liquid saturated with a gas, and the second chamber containing a propellant; wherein movement of the valve mechanism to the open position permits the liquid to be dispensed from the container through the valve mechanism by the pressure of the fluid in the first chamber and dispensing of the fluid from the container decreases the pressure in the first chamber and causes the passage of propellant gas from the

second chamber through the gas-permeable barrier to the first chamber to equalise the pressures in the first and second chambers.

3 A pressurised container according to Claim 2, and further comprising an outlet conduit coupled to the valve mechanism and which extends into the first chamber.

4 A pressurised container according to any of the preceding Claims, wherein the barrier comprises a micro-porous membrane.

5 A pressurised container according to any of the preceding Claims, wherein the barrier comprises a body member manufactured from a gas impermeable material and having an aperture therein, and a gas permeable material covering the aperture.

6 A pressurised container according to Claim 1 or Claim 3 or Claim 4, wherein the barrier is formed around the outlet conduit, the second chamber being defined by at least a portion of the outer surface of the outlet conduit and the barrier.

7 A pressurised container according to Claim 6, wherein the second chamber is an annular chamber extending around outside surface of the outlet conduit.

8 A pressurised container accordingly to Claim 6 or Claim 7, wherein the barrier is sealed to the outlet conduit and to the container adjacent the valve mechanism.

9 A pressurised container according to any of Claims 6 to 8, wherein the propellant comprises a fluid component which is introduced into the second chamber by introducing the fluid component through a sealing member which seals the valve mechanism to the container.

10 A pressurised container according to any of the preceding Claims, wherein the valve mechanism comprises aerating means to aerate the liquid as it is dispensed through the valve mechanism.

11 A pressurised container for dispensing a fluid comprising a container, a barrier substantially impermeable to a pressurising propellant and a fluid comprising a liquid saturated with a gas in the container, the barrier mounted within the container to divide the container into a first chamber and a second chamber and having valve means for selectively allowing passage of the propellant through the barrier, the first chamber communicating with an outlet in the container through which a fluid in the first chamber may be dispensed, a valve mechanism to regulate dispensing of the fluid through the outlet, and an outlet conduit coupled to the outlet and extending into the first chamber, wherein the pressure of a propellant in the second chamber is transmitted to the fluid by means of passage of propellant gas through the valve means in response to a pressure drop in the first chamber caused by opening of the valve mechanism to permit the fluid to pass through the outlet conduit and be dispensed through the outlet.

12 A pressurised container comprising a barrier

substantially impermeable to a pressurising propellant and a fluid comprising a liquid saturated with a gas in the container, the barrier mounted within the container and dividing the container into a first chamber and a second chamber and having valve means for selectively allowing passage of the propellant through the barrier; a valve mechanism isolating an outlet in the container from the first chamber and movable between a closed position and an open position, the first chamber containing a fluid comprising a liquid saturated with a gas, and the second chamber containing a propellant; wherein movement of the valve mechanism to the open position permits the liquid to be dispensed from the container through the valve mechanism by the pressure of the fluid in the first chamber and dispensing of the fluid from the container decreases the pressure in the first chamber to actuate the valve means to permit passage of propellant gas from the second chamber to the first chamber.

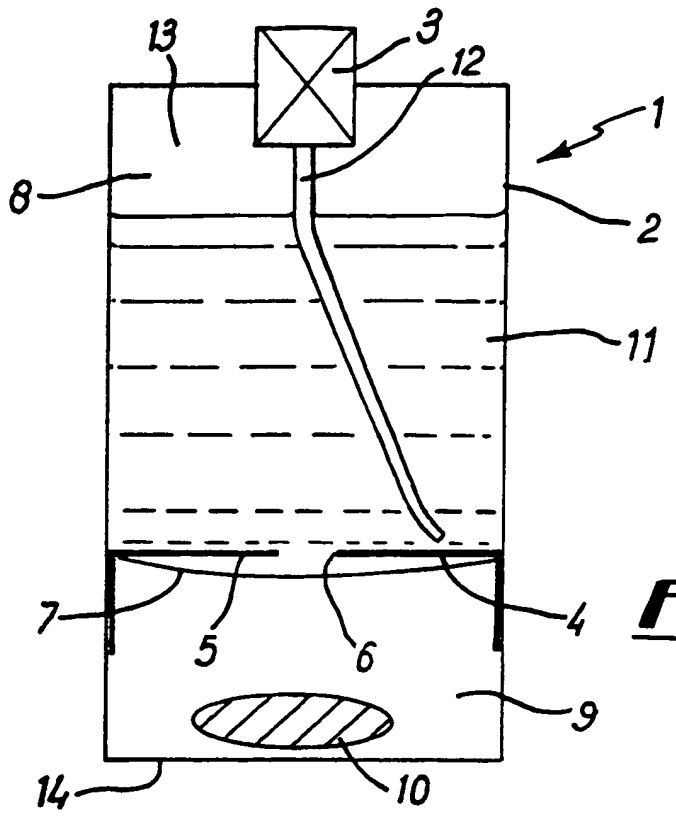

FIG. 1

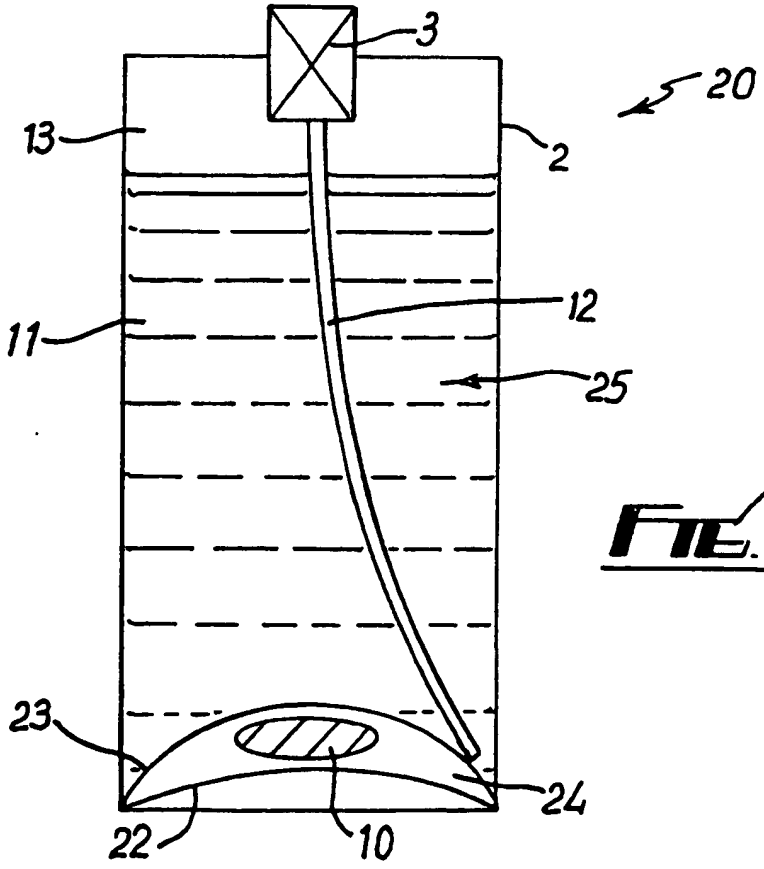

FIG. 2

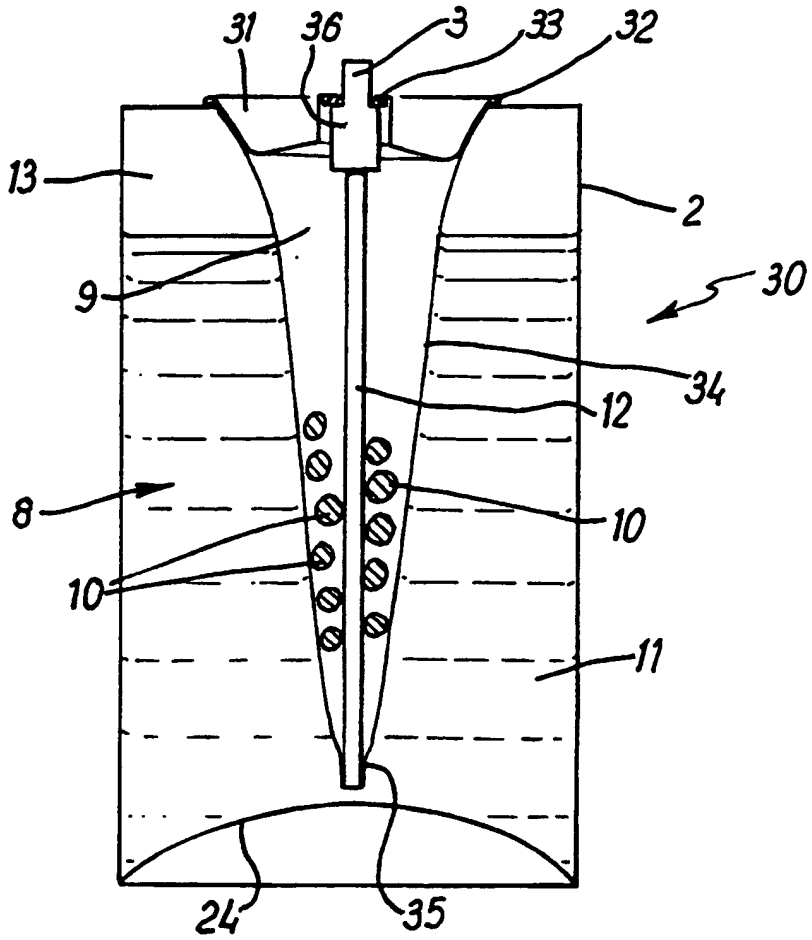

FIG.3

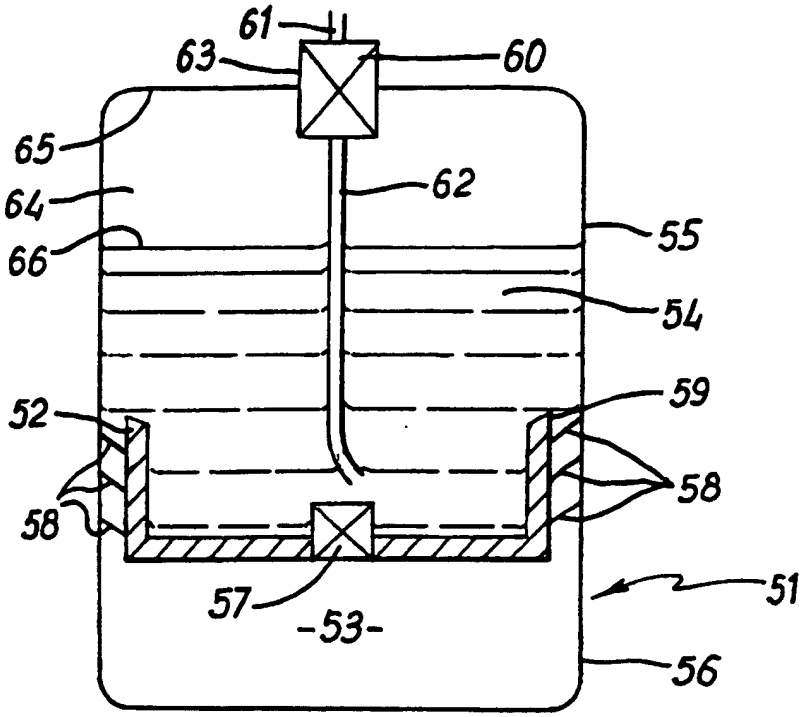
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FIG.4

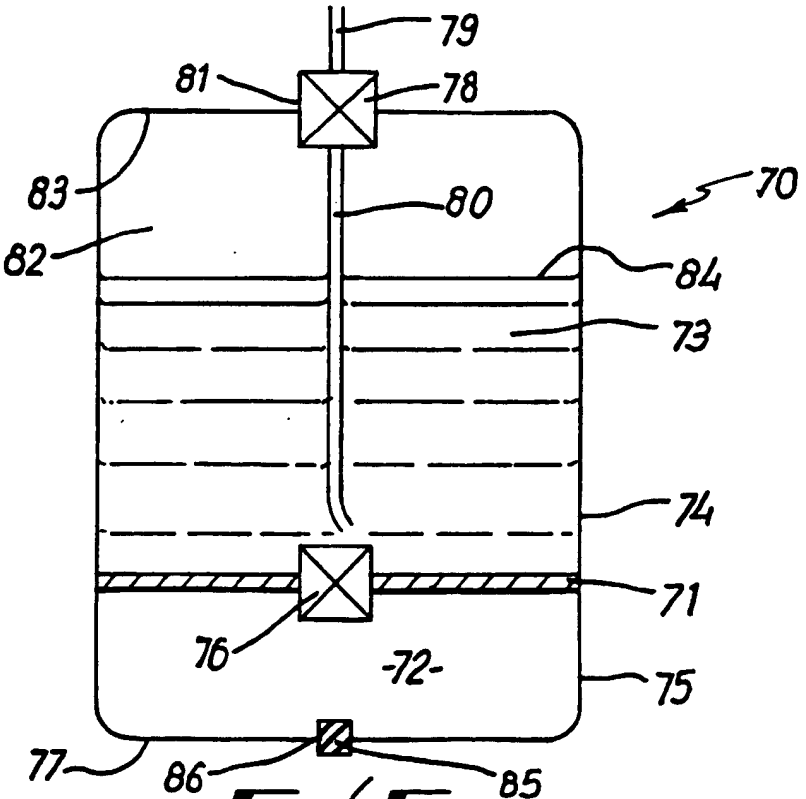
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FIG.5

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 B65D83/14

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	B65D ; F17C

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No.[13]
X	US,A,3 970 219 (SPITZER ET AL.) 20 July 1976 see the whole document	1-7,11, 12
A	DE,A,2 929 348 (THE CONTINENTAL GROUP) 21 February 1980 see the whole document	1,2,11, 12
A	DE,A,2 826 633 (FREUND INDUSTRIAL CO.,LTD.) 3 January 1980 see the whole document	1,2,11, 12

° Special categories of cited documents : [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
09 MARCH 1993	25. 03. 93
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	ELMEROS C.

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

GB 9202112
SA 67607

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 09/03/93

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DE-A-2826633	03-01-80	None		